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The Automotive Industry, Developments in China and Implications for Latin America

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Summary

Due to its dimensions and global scope the automotive industry is often a subject of debate when investment promotion policies, insertion strategies for productive chains, and mechanisms of technology transfer are being discussed. The automotive industry combines three important elements: (i) it is leading the globalization of production (e-commerce, subcontracting, and commercialization), (ii) the production of vehicles in China and East Asia is vitalizing the market and provoking changes in strategies, and (iii) the division between original producers and suppliers is consolidating the number of producers but increasing the number of subcontractors. These new trends, which include productive globalization, China and new production chains, make necessary the formulation of a production strategy by private businesses and appropriate promotion by governments.

The automotive industry is one of the most important in the field of manufacturing in developed countries where, including services and production of automotive spare parts, it accounts for almost 10 percent of industry in the United States, Japan, and several Western European countries. Furthermore, it is also an enormous source of investment for developing countries, due to the peculiar characteristics of the industry which oblige it to establish numerous industrial links and organize production so as to enable it to reduce costs and take advantage of economies of scale so as to penetrate new markets. Building an automobile requires 10,000 parts, more than 800 people working as a team, and decades of research and development.

This industry is also considered strategic by governments promoting industrial policies. In Asia, where industrialization is a joint responsibility of government and

business, countries such as Malaysia, Indonesia, India and China have granted privileges for the creation of a national automotive industry. In Latin America, Argentina and Brazil are competitors in this field, especially the latter which, since the 1950s has defended the development of the vehicle and auto-parts industry.

Table 1. Main Automotive Companies

Manufacturers	Sales (millions of units)
General Motors	8.59
Toyota	6.78
Ford	6.54
Volkswagen	5.02
Daimler-Chrysler	4.36
PSA/Peugeot/Citroen	3.29
Hyundai	3.05
Nissan	2.97
Honda	2.91
Renault	2.39

Source: Automotive News (2004)

Countries such as Japan, South Korea, the United States and several Western European nations have supported, to a greater or lesser extent, the development of this industry, where interventionism has been greater in support of the Japanese and Korean manufacturers, and lower in the case of the US manufacturers, but today any policy which affects this industry is part of the negotiations of the governments which consider it strategic for development and a component of national security.

This study covers the current situation of the Automotive Industry, and the recent trends in Asia and principally China where the industry is growing at accelerated rates, which will have profound effects on the strategies of private companies in Latin America, and will make necessary the formulation of proposals of industrial insertion and public policies.

I. The Automotive Industry and the Global Production Networks

The Automotive Industry is one of the best examples of globalization. It is led by manufacturers from the United States, Japan, Western Europe and South Korea. Where each company has international production and assembly plants from which they supply products to local markets or export abroad. The three major US manufacturers, *General Motors*, *Ford* and *Chrysler*, are still global leaders but closely followed by Toyota, which may become the leading producer in the near future¹.

¹ The net profits of Toyota are already the highest in the automotive industry, 6.7 percent in 2004

In the US the main foreign companies produce and export automobiles from production centers in the country: *BMW* is in South Carolina; *Hyundai*, *Mercedes Benz* and *Honda* are in Alabama; *Mitsubishi* is in Illinois; and the plants of *Toyota*² are in Indiana and Texas. Gone are the days when the entry of manufacturers of foreign automobiles into the United States was criticized, its states currently rather seek to improve the investment conditions to attract automotive companies.

Due to its dimensions this industry is subject to factors that exceed its simple operation as a company. Customs duties and antidumping are not the only matters of discussion as was observed in the past when the United States imposed 'voluntary restriction' measures on the import of small trucks from Japan.

Table 2. Basic Material Required to Manufacture an Automobile	
Material	Cost in Dollars
Steel	\$ 677
Aluminum	\$ 232
Plastic	\$ 237
Glass	\$ 200
Rubber	\$ 198
Other metals	\$ 123
Other material	\$ 174
Total raw material in a vehicle	\$ 1832

Source: Merrill Lynch (Oct/6/2004)

The scope and effects of the Automotive Industry also have two important effects on developing countries, through investments in production plants, and as a consumer of raw materials. Table 2 shows the cost of the physical material involved in the production of a typical vehicle. It is observed that steel, aluminum, rubber and plastic are basic products, so that any increase in automobile production provokes an equivalent demand for raw

material. Any fluctuation in the world steel prices has a direct effect on the profitability and cost structure of vehicles. Various reports of the vehicle industry³ indicate that there have been no drastic changes in the basic components of a vehicle during the last two decades. This means that the demand for materials does not vary as a result of technological advances, but as a result of increased demand and the number of units. This occurs despite the great changes experienced in the industry during the last decade which include a greater computerization of the automobile, transport information

compared to 1.9 percent of General Motors. The Economist (January 27, 2005) "The Car Company in Front."

² Ward's Automotive Reports.

³ See for example Merrill Lynch, Automotive reports (Oct-2004)

systems, advances in hybrid technology, among others, which make the advanced electronic systems of a vehicle approximately 35 percent of the current cost⁴.

This implies that in a small automobile that costs around 15,000 dollars, only 20 percent is the basic raw material, while between 30 and 40 percent are advanced components produced in developed countries, with the rest made up of commercialization and promotion costs.

Table 3. Developing Countries that Export Automobiles and Automobile Parts

Export of Vehicles	% of global exports	Export of Automobile Parts	% of global exports
Mexico	5.23	Mexico	4.11
South Korea	3.96	South Korea	1.33
Brazil	0.62	Taiwan	1.20
South Africa	0.32	Brazil	1.14
Argentina	0.28	China	0.90
Turkey	0.26	Philippines	0.43
Thailand	0.15	Thailand	0.36
Oman	0.11	Turkey	0.36
Colombia	0.06	Argentina	0.34
United Arab Emirates	0.06	Singapore	0.32

Source: UNCTAD Handbook of Statistics [<http://www.unctad.org/>]

Investment also has an essential effect on developing countries. Table 3 shows a ranking of exports of automobiles and automobile parts from developing countries. It is observed that Mexico leads the list supplying vehicles and automobile parts to the United States and Canada. Mexico produces nearly 2 million vehicles of which 70 percent are exported. It is followed by countries in Asia that have a presence in this industry, particularly Taiwan, China, and Thailand, and in Latin America Brazil, Argentina and Colombia.

It should be noted that China only appears as a supplier of automobile parts and accessories in fifth place after Mexico, South Korea, Taiwan and Brazil. This order will be modified during the next few years, since many manufacturers of automobile parts established themselves in China during the last five years. Toyota, which produces vehicles and automobile parts in Tianjin and Sichuan, could start exporting to the rest of

⁴ See Veloso and Kumar (2002), Page 5.

Asia depending on the scale of production and the regional strategy. The Japan Bank of International Cooperation (JBIC), which carries out an annual survey among more than 900 Japanese companies⁵ operating abroad, shows that the intentions of the Japanese companies to increase investments during the next few years privilege India and China, particularly in the manufacturing and marketing of vehicles and electronic artifacts.

The automotive industry produces approximately 60 million vehicles per year including automobiles, small trucks, trucks, and autobuses. The market is relatively dominated by recognized brands in the United States, Japan and Europe. However, an entire network of manufacturers of automobile parts and components exists that has two functions, the assembly of modules (which are important parts of a vehicle composed of different components) and the manufacturing of chassis, which are normally not easy to export due to their size and must be produced locally. The main manufacturers, the recognized brands, are called OEMs (Original Equipment Manufacturers). The OEMs are the ones in charge of the commercialization, investigation and development, design and administration, and they are the ones who determine the multinational strategy of the industry.

The manufacturers of automobile parts and components are less known by their name but equally important, since they are usually linked to one of the major OEMs and are located in productive centers near the production plants following their investment decisions. Among these companies are found *Delphi*, *Magna*, *Johnson*, *Visteon*, *Goodyear*, *Tenneco*, *TRW*, *Denso*, and others that produce automobile parts and have the capacity of international localization working on products or modules such as the complete ignition or brake system that can be attached directly during the productive process⁶.

There are also suppliers and subcontractors that are in charge of the complete production process, and this tendency will be emphasized in the future especially for automobile companies from the United States, whose supplier network is greater than that of the Japanese and European brands. The pyramid structure that has appeared during the last decade has an antecedent in the keiretsu system, the integrated production of the Japanese conglomerates. But the difference is that although the relationship of Toyota with its suppliers continues to be pretty strong and long term, the system of *General Motors*, *Ford* or *Chrysler* is much more flexible and less permanent. This has the advantage that there is greater pressure to reduce prices and subcontract

⁵ JBIC 2004, Entrepreneurial survey of investment preferences number 16.

⁶ Maxton and Wormald (2004)

from plants and suppliers overseas, but at the same time from the position of developing countries, it minimizes the cooperation and coordination for the transfer of technology and the creation of production links.

In the distribution field, the automotive industry is divided into direct distributors dependent and independent of the main manufacturers. These distributors have an important role because they are in charge of the promotion and preparation of automobile acquisition schemes. The automobile is the second most important purchase of a family after a home, and in developing countries it is for some sectors the main acquisition every fifteen years. This leads to a related group of companies that is involved with the used vehicle and recycling market that acquires importance the smaller the country in economic terms. This used vehicle export market is considerable in China and Asia, as well as in many countries in Latin America.

It is necessary to observe what occurs in the international markets to find a strategy that benefits other developing countries.

II. The Automotive Industry in China and Asia

After many years of stagnation, the global automotive industry is growing at an accelerated speed due to the growth of demand in Eastern Europe, India and China. It is in the last market where the most radical changes are being experienced, with numerous manufacturers entering the market attracted by low production costs, design facilities, and closeness to an enormous growing market that is calculated to surpass 15 percent of the global vehicle market in the next few years⁷. Since the end of 2001, when China was admitted to the World Trade Organization and the opening reforms have been deepened, production and sales have continued to grow adding dynamism to the markets of the region. Nearly 5 million vehicles were manufactured in 2004, and it is estimated that production will grow by 30 percent in 2005⁸. This figure has exceeded the objective of reaching a production of 3 million 200 thousand vehicles by 2005, which was announced in the tenth five-year plan (2001-2005) for the development of the automotive industry.

These growth figures include not only automobiles but also trucks, small trucks and autobuses that will increase with the expansion of roads and highways and the increase in China's commercial and productive flow. Since this market is attractive to

⁷ Gao (2002).

⁸ Fourin China Auto Weekly.

the automotive companies, and at the same time linked to the growing demands in other developing countries, it is necessary to observe it in greater detail.

In 2004 the *First Automobile Works Group Company* (FAW), the largest automotive company of China which is a partner of *Mazda*, *Toyota* and *Volkswagen* sold more than one million vehicles in the internal market and was able to export more than 10,000 units with its own brand⁹. This information, although it is small for the magnitude of the industry, is very significant because it indicates interest and capacity to develop one's own brands, an element that is not an isolated case.

Table 4. Main Chinese Automotive Companies

Chinese Companies	Foreign Partners
First Automobile Works Group Company (FAW),	Volkswagen, Toyota, Mazda
Dong Feng Motor Corporation (DFM)	Citroen
Shanghai Automotive Industry Group Corporation (SAIC)	General Motors, Volkswagen
Tianjin Automotive Industry Group	Daihatsu, Toyota
Gungzhou Auto Group	Honda
Beijing Automotive Industry Group	Daimler-Chrysler
Changan Automobile	Suzuki
Brilliance China Automotive	BMW

Source: China Automotive Industry Yearbook and reports from the industry

In addition to the main Chinese automotive companies, there are those that produce automobile parts and components such as *Wanxiang*, which is planning to manufacture vehicles under its own brand¹⁰, *Wuxi Weifu* which is a public company, *Dong Feng*, and many others that are of Chinese-foreign or public ownership.

China supports the creation of the country's automotive brand. In December 2004 a new policy was approved for the Automotive Industry, which details investment

objectives and intends to convert the Chinese industry into a leading automotive industry by the year 2010, maintaining the measure of conditioning joint-ventures with foreign companies where these will have less than 50 percent of the shares¹¹ and maintaining the high customs duties to protect the import market, controls which, although they may have provoked an elevated level of contraband, have at the same time served to encourage the alliances between Chinese companies and to ensure the transfer of technology and the development of the internal market.

The Chinese companies are not yet advanced and require greater technical

⁹ Ibid.

¹⁰ Gao (2004).

¹¹ China's People Daily Online.[<http://english.people.com.cn/>]

progress to be serious competitors on an international level, however, the rapid development and ‘logistical’ support of the state apparatus to consolidate the industry and promote it could soon convert the Chinese automotive companies into a source of investment abroad.

The Chinese Automotive Industry has not appeared suddenly with the opening of the country, but it has a long history that began in 1950 with the foundation of the Peoples Republic of China, when the country asked the Soviet Union for advice on how to manufacture a national automobile, building the first factory of the *First Automobile Works Group Company* (FAW)¹², currently the main automotive company in the country, in the province of Changchun in 1951,.

Trade with Japan was also prohibited in the 1960s and 1970s, but in the face of Chinese demand, especially of trucks and small trucks, the importation of Toyota vehicles began in 1971, followed by other Japanese automotive companies. By the end of the 1970s, the industry began to grow rapidly with the liberalization of the economy, which coincides with the growing tendency of allowing controlled competition in all sectors to increase productivity and modernize the production plants. This growth continued in the 1980s and in the early 1990s it was greatly stimulated by the reduction of controls and the open policy of promotion of competitiveness.

Currently, the Santana model of *Volkswagen*, also known as the Volkswagen of Shanghai, is the most popular model and its design has not been modified in recent years; discontinued in the rest of the world it is being rapidly reduced due to the supply of better vehicles and a greater purchasing power of the Chinese. The experience of this model which was able to prevail with German technology, local production, and in the most cosmopolitan city of China, still communist, shows the early capacity of the country to absorb technology and produce an efficient model.

The automotive industry in China must position itself in a wider plan related to the productive links in Asia. This element is what makes it important for policies and strategies in other developing regions. Figure 1 shows the complex network and productive interdependence of the production of *Toyota* in eastern Asia including China. Motors are produced in almost all of the production plants, transmission systems are produced in Thailand, Philippines and China, speed junctions are produced in China, and components and automobile parts are transferred between production plants in different countries, which make the region a great integrated factory. Once

¹² For a detailed description of the evolution of the Chinese automotive industry see Harwitt (1995).

manufactured and assembled, the different models are sent to the internal market of each country and for export to take advantage of economies of scale and transport.

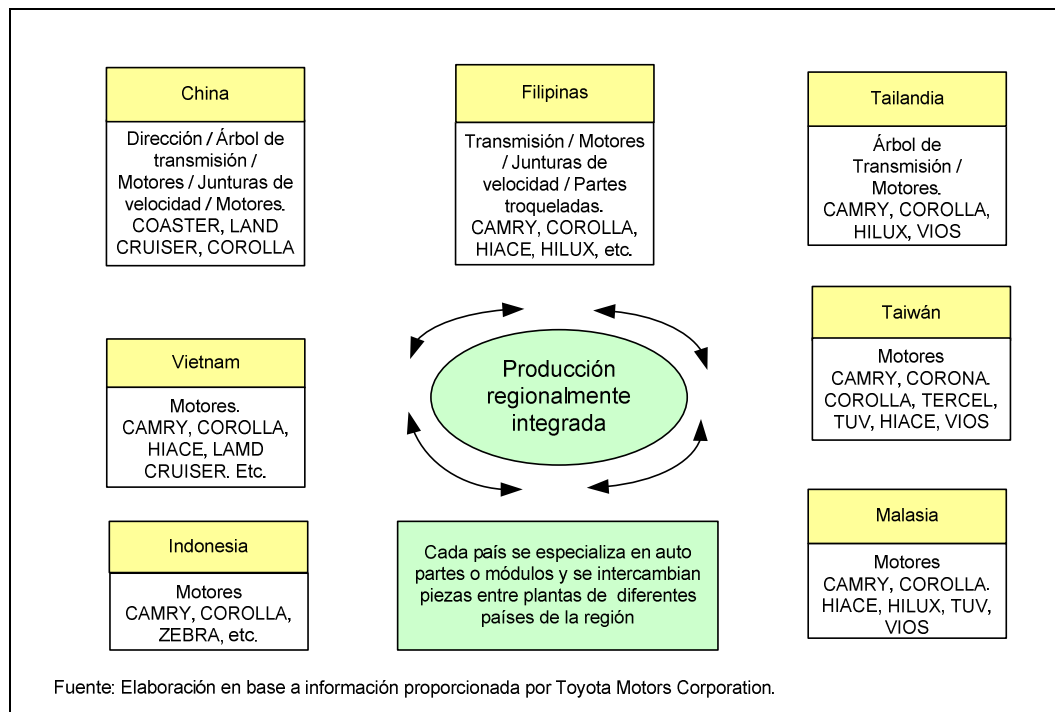


Figure 1. Production Network of Toyota in Asia

For *Toyota* the productive organizational chart differentiates Japan as a separate market, and Asia as a separate market which integrates China and East Asia. Production is exported from Japan and Asia to different countries and regions where there are no production plants. This has been and is possible not only because it is a strategy of *Toyota*, but because of the progressive industrialization that East Asia has received, and the efforts towards the economic integration of the region.

The fast growth and experience of China shows two important elements: first that the domestic policies and market openings are important, and second, that the supply of transport of vehicles and automobile parts throughout countries in the logistic and commercial aspects has contributed to adding dynamism to the markets of the Asian region.

Additionally, China is directing its policies to take advantage of the growth of its market in order to generate production capacity of its own brands, besides the *FAW Group* vehicles that are being exported to Asia, small compact automobiles will soon be introduced in the United States, such as the *Chery*, produced by *Chery Automobile* of

China since 2006.

The Chinese multinationals that produce manufactured goods are growing as can be observed in the cases of *Haier*, for electrical appliances, or *Lenovo*, the manufacturer of electronic office devices known for their Personal Digital Assistant (PDA), which in 2004 acquired the personal computer division of *IBM* in a strategy that positions it as a strong competitor in this area. In anticipation of the growth of the Chinese multinationals, developing countries, both private companies as well as public companies, require a strategy of future investment attraction in assembly or production plants, while working on the integration of markets to facilitate the creation of scale economies.

III. Implications for the promotion of investments and policies in Latin America

A review of the productive structure of the automotive industry in Latin America shows separate production plants with a minimum or no productive link. Figure 2 shows the production and assembly plants of Toyota, this time in Latin America. All of the plants are mainly assembly plants, with the main automobile parts and components imported from foreign markets originating in Mexico or from Asia. (In the automotive industry Mexico is considered as part of the North American market). Brazil assembles motors but it does not manufacture its parts.

This productive structure in which the markets, the production of automobile parts and the production of vehicles are separate, limits industrial development, and the transfer of technology. As simple recipients of parts, the production plants limit themselves to building components without contributing to technological development.

This may be due to logistical and geographical problems, since in South America the Andes mountains in the western part and the immense jungle that occupies a great part of Brazil divide the continent into various separate areas; with the absence of sufficient means of communication by land and a lack of efficiency in maritime transport, applying integrated production systems between countries is extremely difficult. In East Asia, the cities of China, Indonesia, Thailand, Vietnam and the Philippines can be easily accessed from the Japanese ports and among themselves, and production can be easily integrated¹³.

¹³ Although the countries in Eastern Asia are separated by the sea, one of the leading experts in spatial economy compares the region of Eastern Asia with the Northeastern zone of the United

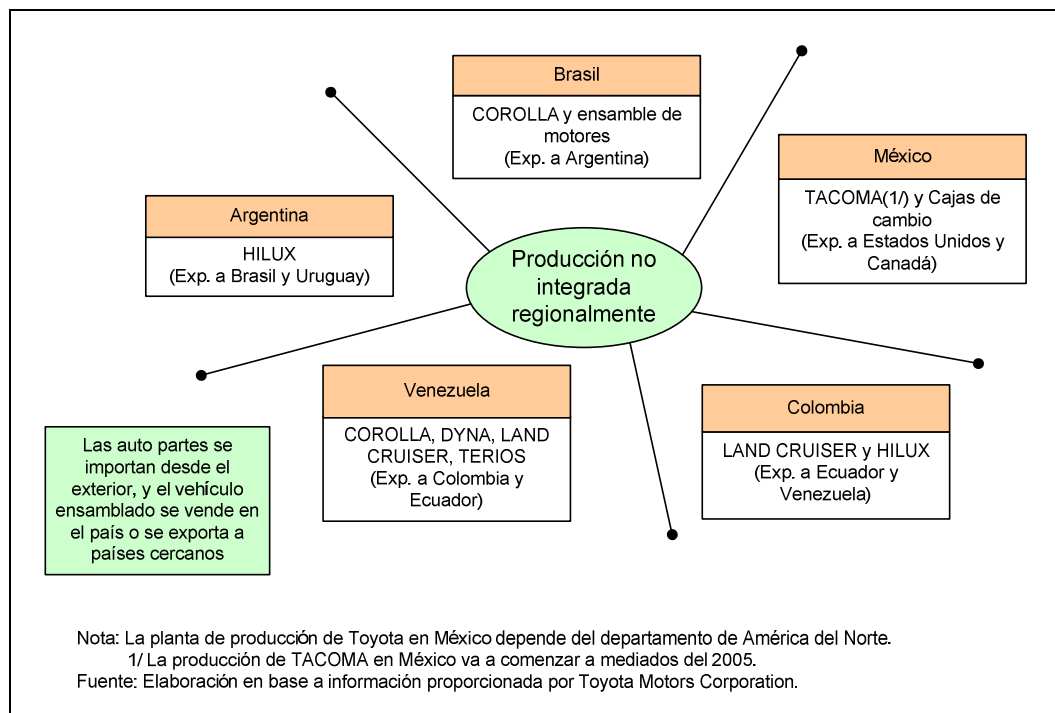


Figure 2. Production Network of Toyota in Latin America

The strategy must privilege greater coordination in order to develop capacities between institutes, engineering faculties and private companies in very specific products of the market. Faced with a lack of government framework and a limited organizational capacity in the public sector, it is necessary to be very selective.

Nether is technological development a product of general policies elaborated at such a macroeconomic level that strategies become abstractions. Table 5 shows the cost and engineering hours required to develop different products in companies that manufacture products with global quality standards, and the indicated costs correspond to the requirements of developed countries, so that it is more relevant to observe the information with regard to the man-hours required and the equipment needed. For example, in order to produce a new screwdriver model for specific application (international quality standard) 1800 engineering hours and one year of development are required. A relatively simple bubble jet ink printer demands 14,000 hours during three

States, indicating that both regions ease the emergence of industrial conglomerates due to easy access and logistics. Fujita, Masahisa "The Future of East Asian Regional Economies" (Tokyo, December 2, 2004). Paper prepared for the conference on Globalization and Regional Integration with Paul Krugman and Anthony Venables.

years, involving 65 professionals.

Table 5. Hours Required to Develop Selected Products in the United States

	Screwdriver (Stanley)	Roller Skate (Rollerblade)	Bubble jet printer (Hewlett-Packard)	Automobile (Concorde by Chrysler)	Passenger Airplane (Boeing 777)
Number of Components	3 pieces	35 pieces	200 pieces	10,000 pieces	130,000 pieces
Time required for development /1	1 year	2 years	3 years	6 years	30 years
People working as a team	2 people	3 people	65 people	850 people	6,800 people
Hours-Man of Engineering required	1800 hours	8500 hours	14,000 hours	2.5 million hours	-
Cost of development in dollars /2	\$150,000	\$750,000	\$50 million	\$1000 million	\$3,000 million
Annual production volume estimated by company /3	100,000 units	100,000 units	1'500,000 units	250,000 units	50 units

Note: 1/ Since the conception of the project, up to investigation, manufacture and commercialization.

2/ Costs in the United States and for the companies and brands mentioned that have international quality standards.

3/ Sales volume so that the development investment of the product is profitable.

Source: Prepared on the basis of figures from Ulrish and Eppinger (1995) "Product Design and Development", and Web Sites of the mentioned companies.

A strategy of complementarity between Latin American countries would have to start by having available an evaluation of the relative production capacities. For example, are 1800 hours required to produce a standard screwdriver?. What is the existing capacity for producing components such as rearview mirrors, seats, or spark plugs? What degree of complementarity can be offered by countries such as Brazil or Argentina, or between the countries that belong to the Andean region?

The automotive industry also requires very specialized quality and production norms since a small part can be the cause of recalling an entire line of vehicles especially when there is the possibility of accidents. This is why even in Mexico, which exports US\$16 thousand millions per year in vehicles and automobile parts, local industries have many difficulties in developing productive complementarity¹⁴, and this means that the technological coordination could be increased to improve quality and production.

¹⁴ CEPAL (2004).

With regard to the Automotive Industry, it has been consolidated during the last few years, in which OEMs have merged and concentrate their production in fewer markets, which are followed by a group of suppliers that compete to produce components and automobile parts practically from any market.

Table 6. Vehicle Assemblers in Latin America

	Argentina	Brazil	Colombia	Chile	Mexico	Venezuela
United States						
General Motors	O	O	O	O	O	O
Ford	O	O			O	O
Chrysler	O				O	
Europe						
Volkswagen	O	O			O	
Fiat	O	O				O
Mercedes-Benz	O	O				
Renault	O					
Saab	O	O				
Japan						
Toyota	O	O	O		O	O
Nissan			O		O	

Source: Elaborated based on the Foreign Investment Report of CEPAL (various numbers) and reports from the industry, (The Economist Intelligence Unit, Business Monitoring, etc.).

This situation could lead to an even greater concentration of production, where the design and commercialization determine the progress of the industry, and where the components and automobile parts become raw materials with a minimum added value and offering a limited profitability. Although a recent study made by the World Bank¹⁵ warns of the risk of countries specializing in segments that do not require much technological development, this is the only possibility of becoming connected to the productive automotive chain in order to generate employment and maintain technological development.

This type of industry does not survive in countries with small markets. Countries excluded from trade agreements that will allow their demand to increase cannot expect the development of an automotive industry. In order to stimulate this industry it is necessary to have mutual support for investigation and development that permits the coordination of efforts between the government, the private sector and the universities.

¹⁵ Yusuf (2004).

State support does not imply subsidies nor the protection of the market, as shown in an important study by McKinsey¹⁶ which shows that foreign investment in the automotive sector is mainly determined by the size of the market (clear cases are Mexico, Brazil and India), and that incentives to attract it based on subsidies usually provoke a loss of efficiency. This is not always true in every circumstance as can be observed in the case of Brazil¹⁷ where the market was closed in the 1950s and foreign automotive companies were also allowed to produce maintaining 100 percent of the ownership of their plants in the country, but requiring that they comply with norms of local content. The growth of the industry in Brazil was possible due to the pressure and demands of the government which were effective due to the size of the market. This strategy is not possible in all of the cases and much less when the estimated demand is limited by the number of habitants and by an uneven distribution of income.

Table 6, “Assemblers of Vehicles in Latin America”, should be considered as a guide of where and how to promote investment in the automotive industry. Note that Japanese companies such as Toyota and Nissan do not have a dominant presence in South America as assemblers despite their importance. Observe that smaller companies, such as *Fiat* and *Renault* could take advantage and establish themselves in order to supply zones like the Andean region where there is no presence of foreign automotive companies that may respond to a future increase in demand.

Foreign investment is the fastest way to achieve technological development and vitalization of production. Companies currently protect the production of advanced technology and for that reason they prefer to maintain the investigation and production of critical components in their base countries (case of Japanese and North American automotive companies), which is why it is only feasible to initially expect the technology transferred to be second generation, and take advantage so that the presence of foreign production and the interaction with investigation centers and universities generates a greater technological transfer and development.

The governments of the different Latin American countries must act as facilitators of technological coordination between foreign and national companies, investigation centers and universities. The agreements that are subscribed and the forums that are held must have the objective of identifying specific automobile parts and components that local industries are capable of supplying to assemblers based in Latin America or in the rest of the world.

¹⁶ McKinsey&Co. (2003), “New Horizons: Multinational Company Investment in Developing Economies”.

¹⁷ Shapiro (1994), and Kamiya and Hisamatsu (2005).

(For Box) The Automotive Sector in Peru

The automotive industry in Peru is small and does not currently have a vehicle manufacturer in the country. It is made up of dealers and maintenance centers and it is limited to the assembly of chassis for trucks and autobuses, where the most important suppliers of parts are *Volvo* and *Scania*.

All of the vehicles are imported, the new ones come directly from manufacturing plants abroad, and the used ones that are repaired and reconditioned enter through the Centers of Export, Transformation, Industry, Commercialization and Services, CETICOS, located in Matarani and Ilo, and through the free zone of Tacna, ZOFRATACNA, where the importers have access to tax exonerations.

The automotive fleet is made up of more than 1.3 million units and it has an average age of 15 years, it is one of the Latin American countries with the oldest and lowest vehicle density¹⁸. In Peru the density is 22 passenger automobiles per 1000 people while in Chile it is 83 per 1000 people¹⁹.

Vehicle production in Peru ended in 2002 with the closing of the Volvo truck plant in Ate-Vitarte. The competition of used vehicles, the low productivity of the Peruvian plants, and the almost inexistent import barriers make production in Peru neither strategic nor profitable. The vehicles from CETICOS occupy 35 percent of the automotive market and although it has provoked the near disappearance of local manufacturing it has generated a small export market of repaired vehicles to Central American and Caribbean countries.

The history of the automotive industry in Peru began with the manufacturing of *General Motors* trucks and vehicles in 1945. A basic but important automotive industry was developed with *Chrysler (Dodge)*, *Ford (Taunus)*, *Datsun* (currently *Nissan*), *Renault* and *Volkswagen (Beetle and Amazon)*. By the end of 1990, *Fiat* began to produce in the country in order to strengthen its position in the Andean zone, but it was forced to close its plant almost immediately due to the competition from used vehicles²⁰.

Between the mid 60s and the end of the 70s a small industry of suppliers was developed in Peru, where *Moraveco* stands out, which was an attempt to develop the

¹⁸ Semana Económica (2004)

¹⁹ Economist Intelligence Unit, various numbers.

²⁰ Business Monitor International, various numbers.

(For Box) The Automotive Sector in Peru

national industry by increasing the degree of local content, but the results were not satisfactory, although work positions were created, the quality did not reach export standards. The commercial opening and the unlimited import of the 1990s prevented the boosting of local production and kept foreign manufacturers away. Furthermore, the pronounced inequality of income makes difficult the creation of credit mechanisms that facilitate the sale of vehicles which contributes to keeping the Peruvian automotive fleet at a low level.

Peru has, however, advantages to offer since it is a member of the Andean Community and it has signed agreements with Mercosur, having access to a greater market which could allow it to generate focused comparative advantages in parts of the productive process of major markets such as Brazil or Argentina, and even Colombia and Venezuela.

Appropriate opening and technical cooperation policies could stimulate the development of this industry. In the past assembly plants required a large fixed capital investment, but the current productive organization of the industry based on suppliers and modules, although it makes it easier to close production plants, also facilitates their creation. If the necessary conditions to provide trained human resources and access to neighboring markets are prepared, the position of Peru in the center of the Andean zone could make it one of the logistical bases of production in Latin America.

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